Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original). In a standard Houdry process for the dehydrogenation of aliphatic hydrocarbons wherein the process defines a cycle that includes the stages of:

(a) loading a dehydrogenation catalyst into a reactor to form a catalyst bed wherein the bed defines a top section, a middle section and a bottom section;

(b) evacuating the catalyst bed;

(c) reducing the catalyst bed with hydrogen and evacuating the bed;

(d) introducing an aliphatic hydrocarbon into the catalyst bed as a gas feed at a preselected flow rate and such that the feed initially contacts the top section of the bed and exits after contact with the bottom section and after the hydrocarbon is dehydrogenated;

(e) steam purging and regenerating the catalyst bed;

(f) repeating stages (b) through (e); and

wherein the length of stages (b) through (e) are controlled by a sequencer, the improvement of

(1) extending the cycle length by the introduction of a delay of at least one predetermined time interval into at least one stage of the cycle; and

(2) introducing hydrogen gas into the reaction at stage (d).

Claim 2 (original). The process of Claim 1 wherein the reaction cycle is extended by the introduction of one or more delays added to a program controlling the sequencer.

Claim 3 (original). The process of Claim 2 wherein the delay is defined in terms of minutes.

Claim 4 (original). The process of Claim 2 wherein the delay is defined in terms of seconds.

Claim 5 (original). The process of Claim 1 wherein the extended reaction cycle produces temperature ranges in each section of the catalyst bed that are greater than the temperature ranges produced in a standard Houdry process.

Claim 6 (original). The process of Claim 1 wherein the hydrogen gas added at stage (d) is added at concentrations of up to about 7 mol% H_2.

Claim 7 (original). The process of Claim 6 wherein the hydrogen gas added at stage (d) is added at concentrations of from about 2 mol% H_2 to about 7 mol% H_2.

Claim 8 (original). The process of Claim 1 wherein the hydrogen gas source for introduction at stage (d) is from a recycle process associated with the dehydrogenation reaction.

Claim 9 (original). The process of Claim 1 wherein a plurality of reactors function in tandem in a manner such that while a first set of reactors is receiving feed (stage d), a second set of reactors is in the regeneration stage (stage e), and wherein the delay introduced in the first set of reactors results in a concomitant delay in the second set of reactors.

Claim 10 (original). The process of Claim 9 wherein the length of the process stages for each set of reactors is controlled from the sequencer.

Claim 11 (original). The process of Claim 9 wherein a modification in the length of any process stage in the first set of reactors is accompanied by an essentially equal modification in the length of the same process stage for the second set of reactors.

Claim 12 (canceled).

Claim 13 (original). In a standard Houdry process for the dehydrogenation of aliphatic hydrocarbons wherein the process defines a cycle that includes the stages of:

(a) loading a dehydrogenation catalyst into a reactor to form a catalyst bed wherein the bed defines a top section, a middle section and a bottom section;
(b) evacuating the catalyst bed;
(c) reducing the catalyst bed with hydrogen and evacuating the bed;
(d) introducing an aliphatic hydrocarbon into the catalyst bed as a gas feed at a preselected flow rate and such that the feed initially contacts the top section of the bed and exits after contact with the bottom section and after the hydrocarbon is dehydrogenated;
(e) steam purging and regenerating the catalyst bed;
(f) repeating stages (b) through (e); and

wherein a plurality of reactors function in tandem in a manner such that while a first set of reactors is receiving feed (stage d), a second set of reactors is in the regeneration stage

(stage e), and the length of stages (b) through (e) are controlled by a sequencer, the improvement of

(1) extending the length of at least one stage of the cycle for each set of reactors by the introduction of one or more delays of a predetermined time interval added to a program controlling the sequencer; and

(2) introducing hydrogen gas into the reaction at stage (d) at concentrations of up to about 7 mol% H_2.

Claim 14 (original). The process of Claim 13 wherein the hydrogen gas added at stage (d) is added at concentrations of from about 2 mol% H_2 to about 7 mol% H_2.

Claim 15 (original). The process of Claim 13 wherein the hydrogen gas source for introduction at stage (d) is from a recycle process associated with the dehydrogenation reaction.

Claim 16 (original). The process of Claim 13 wherein the length of the cycle for each set of reactors is controlled from the sequencer.

Claim 17 (original). The process of Claim 16 wherein the delay introduced in the first set of reactors results in a concomitant delay in the second set of reactors.

Claim 18 (original). In a standard Houdry process for the dehydrogenation of aliphatic hydrocarbons wherein the process defines a reaction cycle that includes the stages of:

(a) loading a dehydrogenation catalyst into a reactor to form a catalyst bed wherein the bed defines a top section, a middle section and a bottom section;

(b) evacuating the catalyst bed;

(c) reducing the catalyst bed with hydrogen and evacuating the bed;

(d) introducing an aliphatic hydrocarbon into the catalyst bed as a gas feed at a preselected flow rate and such that the feed initially contacts the top section of the bed and exits after contact with the bottom section and after the hydrocarbon is dehydrogenated;

(e) steam purging and regenerating the catalyst bed;

(f) repeating stages (b) through (e); and

wherein the length of stages (b) through (e) are controlled by a sequencer; and

wherein a plurality of reactors function in tandem in a manner such that while a first set of reactors is receiving feed (stage d), a second set of reactors is in the regeneration stage (stage e), and the length of the process stages for each reactor is controlled from the sequencer; the improvement of

(1) introducing delays of predetermined time intervals in a program controlling the sequencer so as to extend the length of each process stage in each reactor; and

(2) introducing hydrogen gas into the reaction at stage (d).

Claim 19 (original). The process of Claim 18 wherein the hydrogen gas added at stage (d) is added at concentrations of from about 2 mol% H_2 to about 7 mol% H_2.

Claim 20 (original). The process of Claim 18 wherein the hydrogen gas source for introduction at stage (d) is from a recycle process associated with the dehydrogenation reaction.